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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,026

03/13/2007

Jozef Thomas Martinus Van Beek

EPC-019

4725

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7590

09/08/2009

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EXAMINER

KUSUMAKAR, KAREN M

ART UNIT

PAPER NUMBER

2829

MAIL DATE

DELIVERY MODE

09/08/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,026	<b>Applicant(s)</b> VAN BEEK ET AL.	
	<b>Examiner</b> KAREN M. KUSUMAKAR	<b>Art Unit</b> 2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-7 and 12-16 is/are allowed.
- 6) ☒ Claim(s) 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Request for Continued Examination***

1. The request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e) and a submission, filed on 6/19/09 is accepted.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Kubena et al. (US 6,580,138)*** in view of ***Ruffner et al. (US 5,949,071)***.

Kubena teaches an electronic device comprising a micro-electromechanical systems (MEMS) element at a first side of a substrate (see Abstract and Fig. 12A), the MEMS element comprising a first (contact electrode 38-2) and a second electrode (element 22-2, Fig. 12A) that is movable towards and from the first electrode between a closed and an opened position (col. 2:30-33), and that is separated from the first electrode by an air gap in its opened position (Fig. 12A), wherein the device comprises an etch stop layer (silicon dioxide layer 34, Fig. 12A) between the first electrode and the substrate (col. 6:46-48), the etch stop layer comprising a substantially non-conducting, fluorine

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chemistry inert material that is inert again chemical dry etching using fluorine chemistry (silicon dioxide is resistant to fluorine) and the substrate being etchable with fluorine chemistry (the substrate is silicon, and silicon is etchable with fluorine).

Kubena does not teach the etch stop layer comprises  $\text{HfO}_2$ ,  $\text{ZrO}_2$ , or  $\text{TiO}_2$ . However, Ruffner does teach the use of  $\text{TiO}_2$  as an etch stop layer (col. 8:46-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an etch stop layer comprising  $\text{TiO}_2$  as taught by Ruffner so as to achieve a higher etch selectivity.

#### ***Allowable Subject Matter***

4. Claims 1-7 and 12-16 are allowed. See Office Action dated 3/5/09 for reasons for allowance.

#### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hwang et al. (US 2003/0059720) para. [0178] and Dove et al. (US 2001/0051302) para. [0042] show the use of high-k dielectric materials, in general, and  $\text{TiO}_2$ , specifically, as an etch stop layer for better etch selectivity.

6. Any response to this Office Action should be faxed to (571) 273-8300 or mailed to:

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Hand-Delivered responses should be brought to:

Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAREN M. KUSUMAKAR whose telephone number is (571) 270-3520. The examiner can normally be reached on Mon - Thurs 7:30a - 5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on 571-272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. M. K./  
Examiner, Art Unit 2829  
8/31/2009

/Ha T. Nguyen/  
Supervisory Patent Examiner, Art Unit 2829